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July 1989 THE HUGgers NEWLETTER Volume 7, Number 6

TI NEWS & SUCH

An interesting new program form Inscebot is TI-SORT. TI-SORT is an assembly language program that quickly sorts data filels from most TI data base type programs including TI-BASE and from any program that produces fixed length files, or delimited files. The program will sort files of up to 99,999 records by up to 8 fields. The program will retail for $14.95 + $2.50 shipping & handling.

Inscebot has also announced a new version of TI-ARTIST, it may be called TI-ARTIST PLUS or version 3.0. It apparently will be much more than just an upgrade.

From, Australia, there is news of a new multi-function card that will consist of 32k memory, RS232, and DSDD disk controller on one board.

The latest news (as of 6/4/89) on the Zeno Board, a multi-purpose board by Eric Zeno, is that it is ready to be sent to a circuit board manufacturer for production. The board should be ready for distribution in August.

Asgard has a new program out called PagePro 99, which is getting good reviews. It is an assembly language program for designing individual pages. It is a what-you-see-is-what-you-get type program that allows mixing of text in various fonts, and TI-Artist pictures on a page. Apparently it offers quit a few innovative features and much flexibility. The program sells for $24.95. Asgard currently has special prices for group orders. For 4 or orders a 10% savings or for 12 or more orders a 20% savings. If interested call Gary McQuade.

(CONTINUED ON PAGE 2)

PUTTING GROM BASED CARTRIDGES IN YOUR CONSOLE (The Easy Way)

John F. Willforth - West Penn 99ers - Dec 88

If you would like to install several (up to 6 GROM chips) inside your own console without any circuit boards, and just a little wire, listen up!

Because the addressing is internal in a GROM, they can be stacked, and all of the GROM sockets in the TI-99/4A are pin-for-pin identical to each other. Take GROM 0, 1 and 2 from their sockets above the CPU chip, and stack them carefully and solder ALL 16 of their legs together. Now plug the whole 3-Chip unit in the GROM socket next to the Sound chip, observing direction (pin 1 location). Now you will note that you have two empty GROM sockets with the potential of six of these little beasties being stacked right on the CPU board. First though, you better test the console to see that you have everything still operational.

Multi-Plan requires five GROMS, and Editor Assembler one, for a total of six, and this will be one example of a full boat for these sockets without cutting a hole in the RF shield to stack these chips to sky-scraper proportions. You may prefer TI-Writer, one GROM, Disk Manager II, two GROMS, or any of the many GROM only cartridges that TI made, even games could be included in this list.

To keep this simple, however, I reference Multi-Plan and Editor Assembler. Remove the groms from their circuit boards carefully. Since you must keep all five of the MP chips selected at the same time, I would recommend that you make note of the E/A chip so that it doesn't get mixed with the MP chips just yet.

Stack any three of the MP chips and solder them together as you did to the console GROM chips earlier. Cut the part of pin 14 off the bottom chip of this 3-chip unit so that when this unit is inserted in the middle of the three sockets, there will be no connection to the corresponding pin in the GROM socket, but be sure that all three GROM pin 14s are soldered together. Now take the other two MP GROMS and piggy back them, and cut the bottom of pin 14 as before. Pick up the E/A GROM and bend pin 14 straight out; you don't have to cut it's pin. Slip the two MP GROMS on the TOP of the E/A GROM, and solder ALL but 14.

Using 3 - 12" lengths of multi-stranded wire (ribbon-cable works well), attach the center wire to the column of three pin 14s on the console GROMS by using a low wattage soldering iron, and one of the other two wires to the single pin extended from the E/A GROM, and the remaining wire to the two pin 14s of the MP immediately above the E/A GROM. Connect the two MP GROM pin 14s to the three MP GROM pin 14s in the middle GROM socket using a short length of wire.

Using an SPDT switch (on that is OFF in the center, and will stay on when it is thrown to either side), solder the

(CONTINUED ON PAGE 2)

Orphanage

(The following article was inspired by a like story in the Boston Computer Society, TI Group.)

Come this next October, we will have been in the 'Orphanage' six years. That's a long time to enjoy an unsupported computer system that does anything the big guys can do with their computer, and on a home computer budget.

But how many years can all of this keep up? Every year, it seems there is something new, but the well must be running dry. MYARC did the GENEVE. They did the Hard and Floppy Disk Controller. There are Artist programs, word processors, data base programs, telecommunication programs, spread sheets, in short every software area has been covered. Take MACFLIX for example; there's a real good advance: if we can't draw an 80 column picture, MACFLIX lets us print pictures from a computer that can. We have RAM DISKS and 80 column cards for the screen like DIJIT and MECHANTRONICS. We can run 80 track disk drives—that's 2880 sectors per disk!

But how long can we keep up, you ask? We're thinking a long time. The 99/4A system can do anything you need a computer at home to do including transferring PC work from the job and back again. Printers today allow you to unlock graphics and a Ram Disk will increase memory storage.

The one thing missing perhaps is "raison d'etre", (a reason to exist). We need to continue our efforts to promote our computers and invite others who have laid their equipment on the closet shelf. We also need to support fairware authors and commercial producers if we expect to see more programs.

But even if the bottom of the barrel is close there is no need to panic. Support the market and the market will support you.

8K DSR Card Article

-by John A. Johnson. Miami Users Group.

This text will explain the proposed usage of an 8k DSR card.

Up to know, a full blown TI was considered a machine with disk drive(s) and 32k memory expansion. For years the 32k memory has served us well, but with the advent of new, sophisticated software on the horizon, our computers could use a little more help. I'll tell you one way we can do that, but first, I'll describe the layout of the present 32k memory:

>2000 through >3FFF. This 8k block of memory (refered to as low memory) is used for assembly language program storage while running extended basic programs that CALL LINK to these routines. It can be used by TI Basic (with Editor Assembler installed) to also store machine language ("c", assembly, etc) routines. A pure machine language program can also be loaded into this area.

>A000 through >FFFF. This 24k block of memory is known as high memory. This is where our extended basic programs get placed. This area can also be used by TI Basic to store machine language programs, just like the low memory described above. A pure machine code program normally loads here also.

And that's it! 32k of program space period.

The 9900 CPU in our consoles can access 64k of memory, either RAM, ROM, or a mixture. The present layout of the computer is as follows:

>0000 through >1FFF. ROM in the console. Holds the operating system, part of TI Basic, Keyscan routine, etc.

>2000 through >3FFF. Low 8K memory RAM.

(CONTINUED FROM PAGE 1)

Finally, John Johnson of Horizon RD Menu fame, has proposed an 8k DSR card for the P-Box. He has build a card with a standard 8k accessable ram and another 8k ram used as a battery backed DSR. What it apparently does is page in extra ram into space that is usally not used out of the 64k address space of the 9900 processor, givcing you an extra 16k of memory that doesn't interfer with existing memory. For more info see the 8K DSR Card Article in this issue.

- B.C.P.

(CONTINUED FROM PAGE 1)

center wire (from pins 14) of the console GROMS to the center lug on the switch. Attach the other two wires to either of the two remaining lugs on the switch.

Before buttoning up the console, test the switch to see that if the switch is in the middle on power-up, only Console BASIC is on the menu. When the switch is thrown in on of the two possible directions, on power-up, BASIC and EDITOR/ASSEMBLER will appear on the screen, and in the third position, on power-up, BASIC and MULTI-PLAN will appear on the screen. Then locate the switch inside the console in convenient position, and button it up.

If you desire more selections, follow this same scheme, but use a rotary switch to allow more selections. This works, and should take very little time. You may want to order your GROMS from TI instead of tearing up a cartridge. GOOD LUCK!

>4000 through >5FFF. This 8k block has no memory at all. Instead, each peripheral expansion card has a ROM (or RAM) program called a Device Service Routine (DSR) of up to 8k in size. This DSR is "paged" into this >4000 area when the card (RS232, Disk Controller, etc.) is called into service by the operating system. The CPU then runs the DSR which supervises the operation of the hardware on that particular card. Keep in mind that nothing but AIR is located here when no peripheral card is being accessed.

>6000 through >7FFF. This 8k block is where our ROM or RAM cartridges fit into the 9900's memory map. Most of our cartridges are GROM, but AtariSoft, Extended Basic, and a few others have ROM in their cartridges. Keep in mind that when no ROM cartridge is installed, nothing is here except AIR.

>8000 through >9FFF. This area of memory only contains 256 bytes of ram. It's used as a "scratchpad", a place for the operating system to perform all it's calculations, and store keystrokes from the user, etc. All of our memory mapped devices, such as GROM and VDP memory are also accessed through this area.

>A000 through >FFFF. High memory RAM.

So you can see from the above memory map that TI wasted at least 16k of memory - 8k at the >4000 area, and another 8k at the >6000 cartridge space area. What we propose to do is create a new definition of a "full blown" 99/4a, by installing RAM in this 16k space.

So you say "Wait a minute, if I had RAM here how would my peripheral cards get paged in", or, "I could never run another ROM cartridge". Almost true, but what if we could we could "page" in our new RAM at >4000, so that it would only be there anytime a DSR was NOT selected? It would be an 8k block of memory that was FULLY usable, just like the 8k block at >2000. Well, we did! And it works! Now what if we put in another 8k RAM and mapped it into the cartridge space ONLY when ROM (or RAM) doesn't exist already? Well, we can do that too!

So now you're thinking, "big deal, another 16k. no software will use it, because no one knows I have it". A true statement, and one that holds water.

But what if a peripheral card for the P-Box were available, either as a kit, or a completed, ready to run board for a very reasonable price? And what if a whole lot of people bought, or built this kit? Couldn't software such as TI Writer, PRBASE, and DM1000 be modified to utilize the extra ram? YES IT COULD! And new software. If enough people had this super memory card, couldn't software designers target products for it, just as they do for a 32k market now? I think so.

I've built the 8K DSR RAM board, and on it is 8k used as standard, accessable ram, and another 8k ram used as a battery backed DSR. To understand the powers of having a battery backed DSR, just ask any Horizon Ramdisk owner about the versatility of his ramdisk. The card also has a real time clock, battery backed up, as with the DSR ram.

At present, I'm installing the 8k cartridge space ram, and total outlay should be approximately $45 - $50 complete.

Bud Mills will be carrying all the parts required to build this kit. Give him a call at 419-385-5946, or write him at:

Bud Mills Services
166 Dartmouth Drive
Toledo, OH 43614
U.S.A.

John Willforth is looking into making a PC board for the project. We'll know more about this in a few weeks.

John Clulow has the documents, instructions, source code, and some programs to accompany the project.

John Clulow
345 West South Boundary
Perrysburg, OH 43551
U.S.A.
Telephone 419-874-8838

In the future, I hope to add another 64k of ram to the card, using it as GROM. Yes, I think it's entirely possible to have a Gram Simulator on this board also, for little more than an additional $40 or so. Ask any GramKracker owner what versatility he has!

To sum it up, with a 32k machine we can fit an elaborite program like TI Forth in memory, but we have no more memory left to use for data. With a 48k machine, we'll have lots. If we ever expect to have a program such as the flight simulators available for other computers, we need the extra memory.

Let's upgrade!

TIGERCUB TIPS

PUTTING IT ALL TOGETHER #2

by Jim Peterson

The hardest part of learning to program is not in learning what the various commands do - it is in learning how to put them all together to do what you want them to do!

Key in this simple routine and run it, to see what it does. Then read the explanations of each line and see how they do what they do!

Your computer won't take that 6th line in line 110? Just type 5 full lines and enter, bring it back by typing 110 and FCTN X, use FCTN D to scoot the cursor to the end of the line, and type some more.

```
1 !       2-LINE GAME
        by Jim Peterson
- use S&D keys to paint the
white line on the highway
100 CALL CLEAR :: A$=RPT$(CH
R$(143),6):: CALL COLOR(14,2
,2,2,16,16):: CALL SCREEN(4)
:: T=11 :: C=14 :: CALL HCHA
R(22,C+2,42):: RANDOMIZE
110 T=T+INT(3*RND-1)+(T=21)-
(T=1):: PRINT TAB(T);A$ :: C
ALL KEY(3,K,S):: C=C+(K=83)-
(K=68):: CALL HCHAR(22,C+2,4
2):: IF C<T OR C>T+5 THEN ST
OP ELSE 110
```

This is not a finished program, but an example of the ways that efficient programming can accomplish a great deal in very little memory. The screen is cleared and A$, which will be the highway, is defined as ASCII 143 repeated 6 times. A single CALL COLOR is used to color set 14 (the highway) black on black and set 2 (the painter) white on white. T sets the first line of the highway to begin at TAB 11 and C places the painter 3 spaces to the right, in the middle of the highway. CALL HCHAR places the painter on row 22 and column C+2 because an HCHAR column is 2 spaces to the left of a TAB or PRINT column. RANDOMIZE makes a different highway for each game.

INT(3*RND) gives a random value of 0, 1 or 2; subtracting 1 from this gives -1, 0 or 1, so the tab position for the next line of the high- way shifts one space left or right or, if 0, remains the same. +(T=21)-(T=1) uses relational values. If tab is already at 21, adding one would cause the 6-line road to print one line lower and at the left of the screen. So, if T=21 then (T=21) has a true relational value of -1; +(-1) = -1, so 1 is subtracted to keep the tab from going beyond 21. If the tab is already at 1, (T=1) has a true value of -1; -(-1) = +1, so 1 is added to keep tab from reaching 0. If T is not 21 and T is not 1, both have a false value of 0 and no change is made.

A line of the highway is printed, and CALL KEY looks for a keyboard input; the mode 3 accepts any input as upper case even if the alpha lock is up.

C=C+(K=83)-(K=68) is another example of the use of relational values for compact programming. K is the ASCII value of the key that was pressed; 68=D and 83=S. If S was pressed then C=C+(-1)-(0) and C=-1-0 and the painter moves one space left. If D was pressed, C=C+(0)-(-1) and C=C+0+1 and the painter moves right; if no key was pressed (K will equal -1) or any other key was pressed, C=C+(0)-(0).

So, the new position of the painter is printed by HCHAR; if it is less than the current tab position or more than 5 spaces to the right of tab, he is off the road and crashes; otherwise execution goes back to calculate the next random tab position and start over.

And all that in two lines of programming!

Now, what two values could you change to make the game more challenging? Try changing the 6 to a 5 in A$=RPT$(CHR$(143),6) and the 5 to a 4 in C>T+5. How could you offer the option of an easy or difficult game? How could you restart after a crash? Improve the graphics?

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If you have an article you would like to share with the other members mail it to:

John Powell
327 W. Southern Ave.
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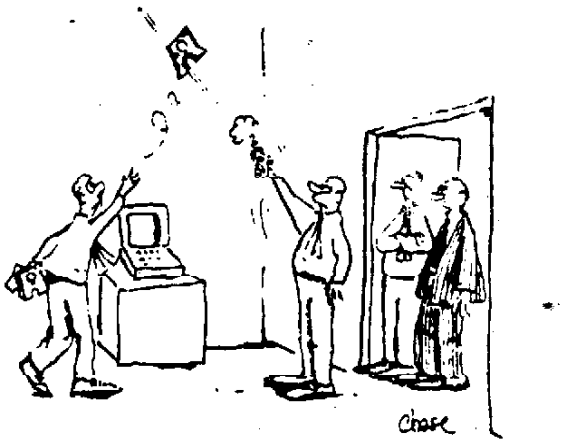
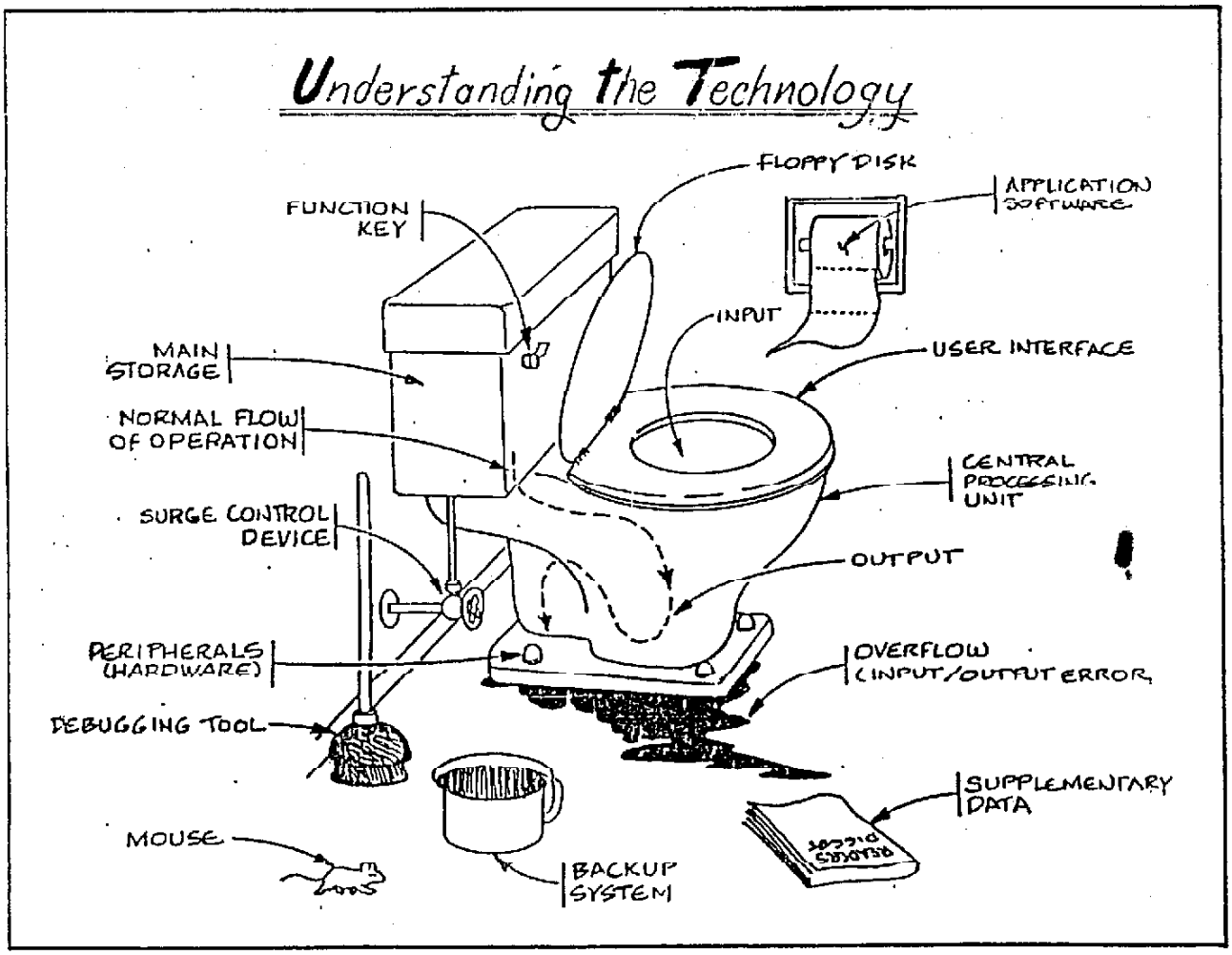


"You say he's the best debugger in the business?"



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